# NEW HEXACTINELLID SPONGES FROM THE MENDOCINO RIDGE, NORTHERN CALIFORNIA, USA

HENRY M. REISWIG

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Two hexactinellid sponges collected by ROV from the Mendocino Ridge by Dr. Andrew G. Carey Jr, are representatives of new taxa of Hexactinellida. The first, *Poliopogon mendocino* sp. nov. (Amphidiscophora, Pheronematidae) is an orange, sheet-like fragment from a 60cm wide, flaring, funnel-shaped sponge sampled at 2332m depth. The lower part of the specimen, and thus the basal spicules, were not collected and are unavailable. A new generic diagnosis for *Poliopogon* is provided. The second sponge, *Nubicaulus careyi* gen. nov., sp. nov. (Hexastcrophora, Euplectellidae, Corbitellinae) is a nearly complete specimen in the form of a soft white cup on long hollow stalk encountered at 2102m depth. It bears distinctive drepanocomes, spirodiscohexasters and aspidoplumicomes, a combination previously unknown among hexactinellids. A reformed diagnosis of *Trachycaulus* is provided from re-inspection of the type specimen. ❐ *Porifera, Hexactinellida, new species, new genus, Mendocino Ridge, Poliopogon, Nubicaulus, Trachycaulus, California.*

*Henry M. Reiswig (email: cxhr@musica.mcgill.ca), Redpath Museum & Biology Dept., McGill University, 859 Sherbrooke St. West, Montreal, Quebec, H3A 2K6, Canada; 6 January1999.*

Hexactinellid sponges from northern California (San Francisco to the Oregon border) are known from only three publications. Schulze (1899) recorded *Rhabdocalyptus dawsoni* from Albatross stn 3349 (1890) W of Point Arena, 437m depth. Talmadge (1973) reported three species, *Aphrocallistes vastus*, *Chonelasma tenerum* (now *Heterochone tenera*) and *Bathyxiphus subtilis*, along with numerous other partially identified specimens obtained by the dragboat fishing fleet out of Humboldt Bay, N. California; specific collection sites were not included. The specimens were reportedly housed at Stanford University, but repeated attempts by the author to locate them have failed. Since the specimens' identities cannot be authenticated, and the original identifier is unknown, Talmadge's report cannot be considered adequate for acceptance as documented species records. Carey et al. (1990) listed hexactinellids collected on Gorda Ridge, at the California/Oregon border. Among the 10 forms reported, only 3 of them — *Staurocalyptus fasciculata*, *Farrea aculeata* and *Aphrocallistes vastus* — were identified to species by a recognised authority. The seven other incompletely resolved forms are still under review; their number is indicative of considerable diversity remaining to be documented in the poorly known hexactinellid fauna of this region. All of the above deal with new occurrences of taxa originally known from other locations. The present report is the first description of previously unknown taxa of hexactinellid sponges from the N. California region.

## MATERIALS AND METHODS

Large sponges were encountered during operations of the Remotely Operated Vehicle (ROV) Advanced Tethered Vehicle (ATV) of the US Navy Deep Submergence Group on a NOAA Undersea Research Program on the Mendocino Fault Ridge off N. California (Fig. 1). This fauna was recorded on video tape and specimens collected by A.G. Carey Jr. in the course of a local faunal survey. After manipulator collection and recovery to shipboard, the specimens were air dried. The two specimens that form the basis of this present report were deposited to the invertebrate zoology collections of the California Academy of Sciences, San Francisco (CASIZ). Comparative material from The Natural History Museum, London (BMNH) was also reviewed.

Sections of the sponge body wall as well as fragments of dermal and gastral surfaces were either whole-mounted in balsam for light microscopy or digested in hot nitric acid. Large spicules in the resulting spicule suspensions were rinsed, spread on microscope slides and mounted

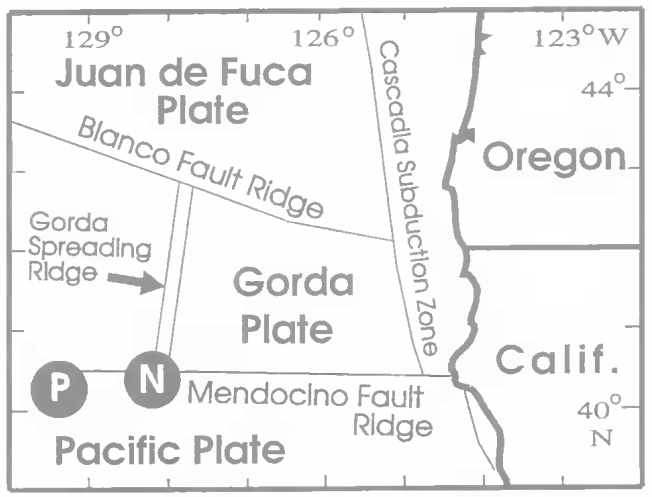


FIG. 1. Collection sites of *Poliopogon mendocino* sp. nov. (P) and *Nubicaulus caryi* sp. nov. (N) and major physiographic features of the northern California / Oregon region.

in balsam. Smaller spicules were dispersed on 25mm diam., 0.2mm pore-size, nitrocellulose filters by filtration; the filters were rinsed, dried and mounted in balsam. Spicules were measured by computer via a microscope-coupled digitiser. Data are reported as: mean ± st. dev. (range, number of measurements). Spicule drawings were prepared from video-captured microscope images imported into a computer drawing program and traced on-screen. Samples for scanning electron microscopy (SEM) were nitric-acid-cleaned and either filtered onto 13mm diam., 0.2mm pore-size, membrane filters or deposited directly onto cover-glasses after rinsing in distilled water. Following gold-palladium coating, specimens were viewed and photographed with a JEOL JSM-840 SEM.

## SYSTEMATICS

Subphylum **Symplasma**
Reiswig & Mackie, 1983
Class **Hexactinellida** Schmidt, 1870
Subclass **Amphidiscophora** Schulze, 1886
Order **Amphidiscosa** Schrammen, 1924
Family **Pheronematidae** Gray, 1872
**Poliopogon** Thomson, 1873

TYPE SPECIES. *Poliopogon amadou* Thomson, 1873:29, Fig. 1.

DIAGNOSIS (summarised from Schulze, 1893:166 and Ijima, 1927:9; emended here). Body lamelliform, either ear-shaped involute plate, disc attached on edge, or widely open funnel attached centrally. Attached to hard substrate by short, broad, brush-like pad of thin bidentate basalia with shafts, extending into the body, entirely smooth; columella lacking. Conspicuous marginal fringe composed of sceptres and uncinates as marginal prostalia. Lateral surfaces smooth; lateral prostalia absent.

REMARKS. *Poliopogon*, established by Thomson (1873) for the type species, *P. amadou*, was augmented by Schulze's (1886) addition of *P. gigas*. It was briefly synonymised with *Pheronema* from 1894 through 1902 due to Schulze's (1894) discovery of two *Pheronema* lacking lateral prostalia, thus removing the only sustaining difference between the genera. After discovery of the missing lateral prostalia in other specimens of those species, Schulze (1902) re-established *Poliopogon* with its earlier complement of two species. Ijima (1927) suggested removal of *P. gigas* from the genus because of its different body shape (a barrel), an action taken up by Tabachnick (1990). The genus presently includes only the type species, *P. amadou*, *P. maitai* (Tabachnick 1988), and the new species, *P. mendocino*, described below. The form erected as *P. amadou pacifica* by Tabachnick (1988) cannot be accepted as a member of the genus due to poor condition of the specimen and/or incomplete description, e.g., lack of sceptres. On the basis of available information, even its family placement cannot be confirmed. It is relegated to Amphidiscosa *incertae sedis* until more details are revealed. Proper rhabdodiactin megascleres (excluding uncinates) are completely absent in this genus as in all Pheronematidae, a point needing reinforcement.

### **Poliopogon mendocino** sp. nov.
(Figs 2A, 3A-B, 4A-J, 5)

MATERIAL. HOLOTYPE: CASIZ 113631: Mendocino Ridge, 300km W. of Cape Mendocino, N. California, 40°21.6'N, 129°23.7'W, 18.ix.1995, 2,332m depth, coll. A.G. Carey Jr., US Navy Deep Submergence Advanced Tethered Vehicle from R/V 'Laney Chouest', stn. MRF-1, dive no. 95-52-153 (Fig. 1).

ETYMOLOGY. Named after the type locality, Mendocino Ridge.

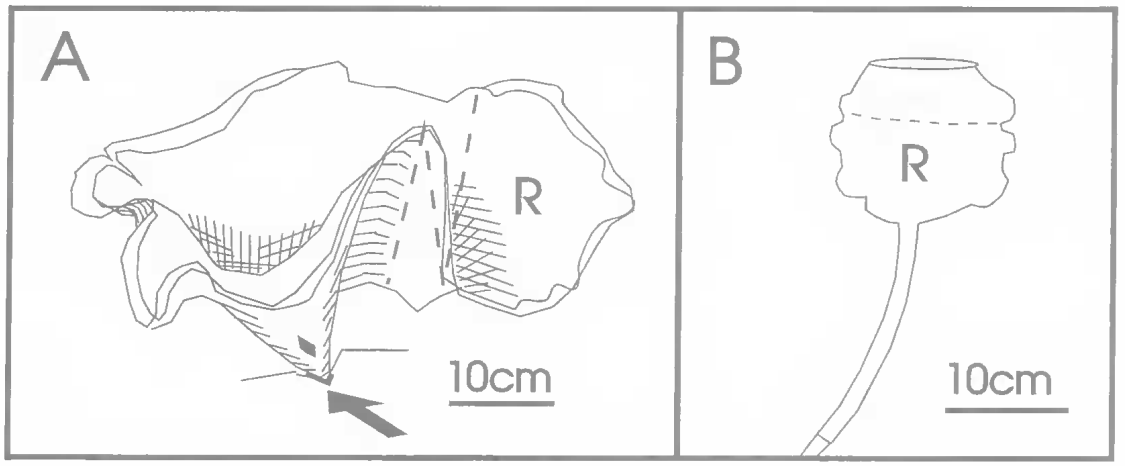


FIG. 2. Gross morphology of the holotypes of A, *Poliopogon mendocino* sp. nov. and B, *Nubicaulus caryi* sp. nov. *in situ* before collection, traced from video clips; the recovered samples are indicated by "R" and the dashed lines; arrow indicates point of attachment.

DESCRIPTION. *Shape.* Single specimen recorded live *in situ* on video tape before sampling (Fig. 2A) with broad flaring funnel, ca. 60cm diam., 20cm high. Robust marginal fringe to 2cm wide extends continuously around strongly undulated distal edge. Large openings of exhalant channels, about 4mm wide, spaced 2cm apart, clearly evident through transparent gastral cover layer within funnel (upper surface). Attachment point at base of a central cone which carried an inferior lateral opening. Approximately one third of the specimen was torn from one side and recovered for study.

Recovered dried sample (Fig. 3A-B) a sheet, 23x29x1.8cm maximum dimensions, with marginal fringe intact on one-half of edge. Gastral surface smooth with exhalant channels clearly evident through gastral cover layer. Irregular, vein-like network of white lines formed by strands of overlapping tangential rays of hypodermal pentactins. Dermal surface more irregular and opaque, with openings of inhalant canals visible through thin transparent dermal cover only in marginal areas. Hypodermal strand system not evident to eye. Both dermal and gastral surfaces lack lateral prostalia.

*Colour.* Gold-colored *in situ* (video recording). Dry sample pumpkin orange, intensified when wetted.

*Skeleton.* Skeleton composed of completely separate spicules; synapticular fusion does not occur. Both surfaces lined by pinnular pentactins forming a delicate and fragile quadrate lattice by overlapping of basal rays; square meshes have

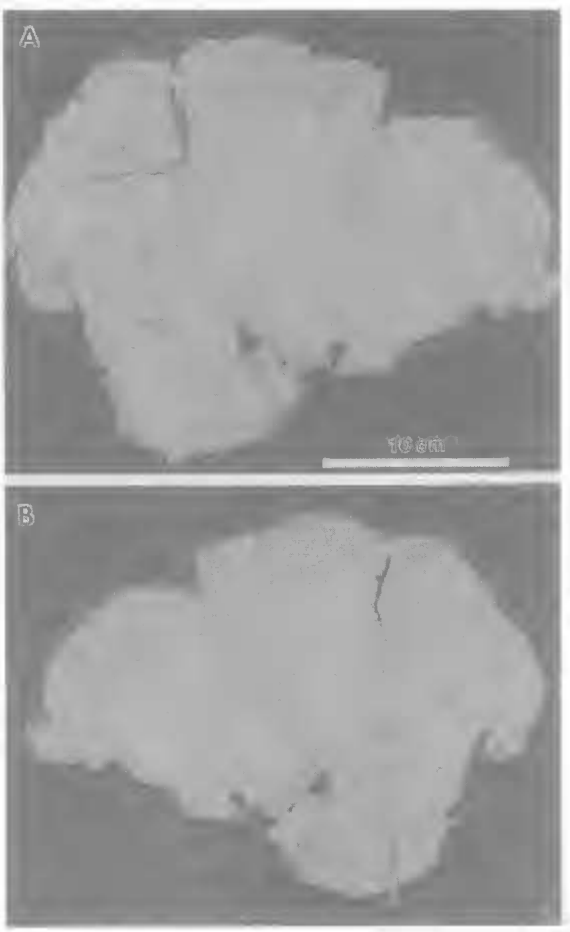


FIG. 3. *Poliopogon mendocino* sp. nov. Holotype. A, Dermal surface. B, Gastral surface.

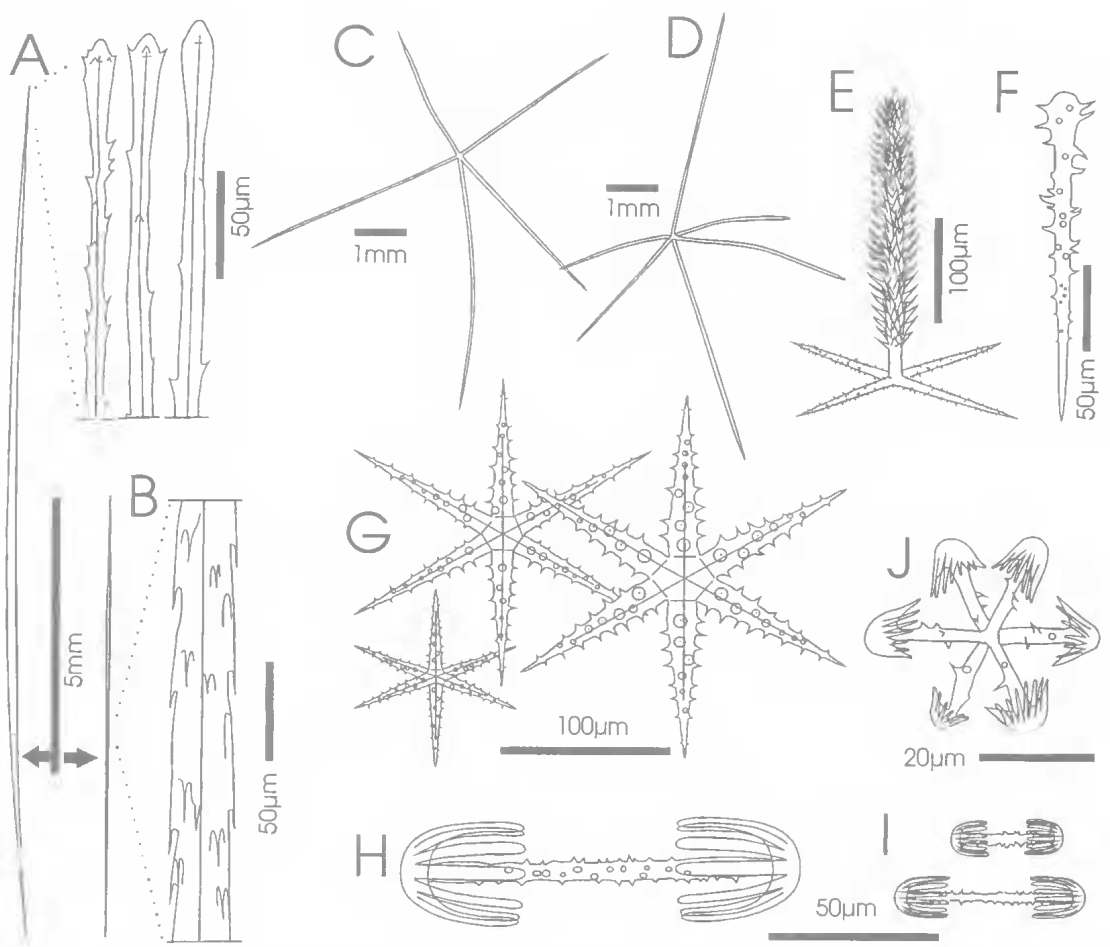


FIG. 4. *Poliopogon mendocino* sp. nov. Holotype spicules. A, Sceptre with three distal tips magnified. B, Uncinate with magnified central segment. C, Macropentactin. D, Three macrohexactins. E, Pinnular pentactin. F, Spiny mesomonactin. G, Mesohexactins. H, Mesamphidisc. I, Two micramphidiscs. J, Microhexadisc.

sides of ca. 100mm. These are supported on tangential rays of large, irregular hypodermal pentactins, with rays overlaping to form subdermal strands on both surfaces, but only macroscopically evident on gastral side. Choanosome supported by principalia which are pentactins and hexactins, both irregular in form and shape of rays. Marginal fringe composed mainly (ca. 95%) of large sceptres, with distal tips mostly broken off, and small component (ca. 5%) of uncinates. Proper rhabdodiactin megascleres (excluding uncinates) absent. Attachment point and associated basal spiculation not included in sample and unavailable for characterisation.

*Megascleres.* Principalia large pentactins and hexactins with thin irregular, curved rays; the same pentactins as hypodermalia and hypogastralia; pentactin (Fig. 4C): tangential ray length 3.1±0.1.3mm (range 1.5-7.3mm; n=50), ray width 37.7±8.4µm (range 19.7-55.5µm; n=50), proximal ray length 2.5±1.2mm (range 0.5-5.9mm; n=50); hexactin (Fig. 4D): ray length 3.4±1.4mm (range 1.2-7.2mm; n=50), ray width 39.3±7.9µm (range 22.8-63.2µm; n=50). Sceptres (Fig. 4A), restricted to marginal fringe, have mainly smooth shafts when mature, with varying degrees of proclined spination on distal extremity just proximal to the tip which bears the axial cross (centrum); the proximal tenth usually roughened; smaller (younger) sceptres entirely spined; length 12.2±2.4mm (range 7.6-19.4mm; n=50), width 41.3±9.9µm (range 19.2-58.6µm; n=50). Uncinates (Fig. 4B) with very low barbs,

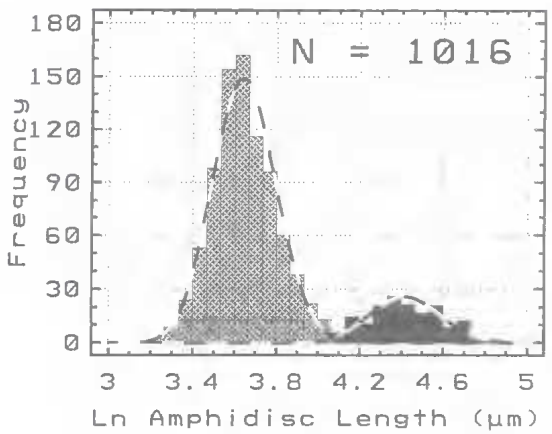


FIG. 5. Frequency distribution of amphidisc length (natural logarithm) from *Poliopogon mendocino* sp. nov. Holotype.

not projecting from spicule profile, also restricted to marginal fringe; length 6.1±1.3mm (range 3.6-9.0mm; n=50), width 20.4±3.8µm (range 8.3-29.1µm; n=50).

*Mesoscleres.* Dermal and gastral pinnular pentactins (Fig. 4E) similar but differ significantly in all dimensions ($P<0.05$); pinnulus has cylindrical profile and basals are long, moderately spined throughout, straight, taper uniformly to a sharp tip, and cross at right angles; no evidence of ray curvature or 'figure-8' form. Dermalia: pinnulus length 226±25µm (range 180-292µm; n=50), pinnulus total width 47±5.1µm (range 36.3-56.3µm; n=50), basal ray length 148±11µm (range 124-171µm; n=50), basal ray width 9.6±1.3µm (range 6.8-12.0µm; n=50). Gastralia: pinnulus length 204±24µm (range 145-238µm; n=50), pinnulus total width 42.9±5.7µm (range 26.2-53.8µm; n=50), basal ray length 128±13µm (range 104-155µm; n=50), basal ray width 8.7±1.1µm (range 6.6-12.2µm; n=50). Mesohexactins (Fig. 4G) exceedingly abundant throughout entire wall thickness; rays perfectly straight, regularly arrayed, strongly spined and highly variable in size and robustness; ray length 84±20µm (range 49-144µm; n=50), ray width (excluding spines) 6.3±2.5µm (range 3.1-12.2µm; n=50). Spiny mesomonactins (Fig. 4F) occur throughout body wall in low numbers, probably representing extreme reduction of mesohexactins; length 152±29µm (range 105-243µm; n=50), width at head (excluding spines) 12.9±4.2µm (range 7.3-25.9µm; n=50).

*Microscleres.* Amphidiscs of a single shape occur in large numbers in surface layers and throughout wall; frequency distribution (Fig. 5) shows two distinct size classes. Mesamphidiscs (Fig. 4H) have uniformly spined shafts and umbels with 8 round-tipped tines, slightly in-turned at tips, length 85±15µm (range 61-131µm; n=166), width 22±3µm (range 14-35µm; n=100). Micramphidiscs (Fig. 4I) similar but umbels carry 11-14 tines, length 39±6µm (range 26-60µm; n=850), width 12±1.5µm (range 9-18µm; n=100). Hexadiscs (Fig. 4J) rare; umbels differ from those of micramphidiscs and invariably differ in size on the two ends of each axis; diameter 33±5µm (range 26-44µm; n=35).

REMARKS. This species differs qualitatively from the other two members of the genus, *P. amadou* and *P. maitai*, in body form, lack of microdiactins and perpendicular junction of pinnule basal rays. It also differs from them in size of largest amphidiscs, and pinnulus ray length. The closer relative of *P. mendocino* appears to be *P. maitai*, the form also occurring in the northern Pacific basin, but detailed similarity cannot be assessed on the basis of the sparse data so far available on *P. maitai*.

Subclass **Hexasterophora** Schulze, 1886
Order **Lyssacinosa** Zittel, 1877
(sensu Ijima 1927)
Family **Euplectellidae** Gray, 1867
Subfamily **Corbitellinae** Ijima, 1902
**Nubicaulus** gen. nov.

TYPE SPECIES. *Nubicaulus careyi* sp. nov.

ETYMOLOGY. Descriptive combination from Greek: *nubis* = cloud and *caulus* = stalk; the cloud-stalk or stalked cloud sponge.

DIAGNOSIS. Body form a cup on a long, thin, hollow stalk. Principalia are diactins and hexactins. Dermalia and gastralia are pinnulate hexactins. Mieroscleres are drepanocomes, spirodiscohexasters, and aspidoplumicomes.

DISTRIBUTION. Known only from the type locality of the type species: Mendocino Ridge off Cape Mendocino, N. California, U.S.A. (Fig. 1).

**Nubicaulus careyi** sp. nov.
(Figs 2B, 6A-G, 7A-F)

MATERIAL. HOLOTYPE: CASIZ 113632: Mendocino Ridge, 300 km w of Cape Mendocino, northern California, 40°22.5'N, 128°08.4'W, 23.ix.1995, 2,074m depth, coll. A.G. Carey, Jr., US Navy Deep Submergence Advanced

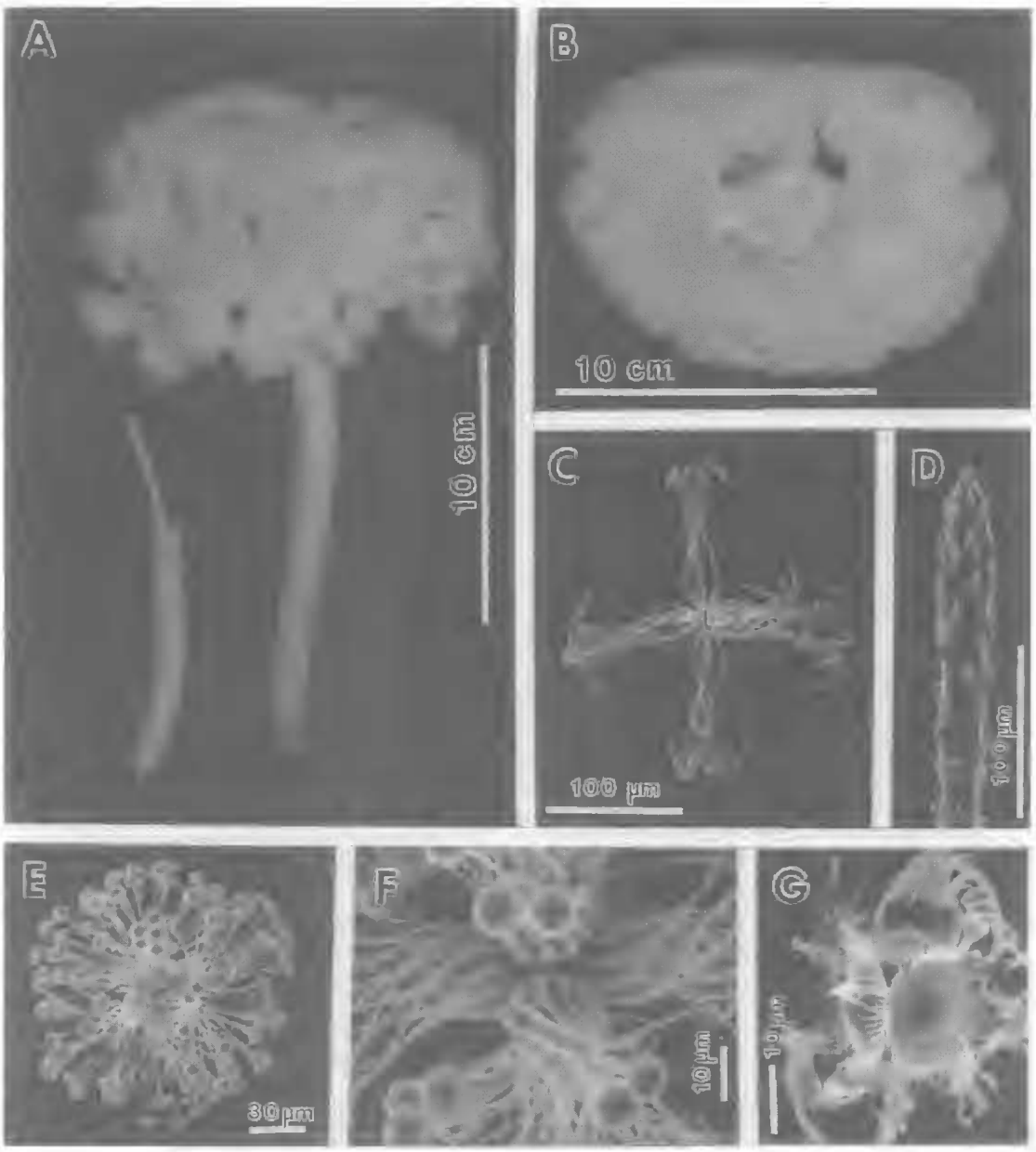


FIG. 6. *Nubicaulus caryi* sp. nov. Holotype, specimen and spicules (SEM). A, Recovered sample in lateral view. B, View of the distal surface. C, Drepanocome. D, Distal pinnulus tip of a dermal pinnule. E, Spirodiscohexaster. F, Magnified view of central secondary ray bundles showing counterclockwise spiralling. G, Aspidoplumicome showing secondary rays originating in a single marginal whorl.

Tethered Vehicle from R/V *Laney Chouest*, stn. MRF 5-10, dive no. 95-54-155 (Fig. 1).

ETYMOLOGY. Named in acknowledgment of the extensive effort and accomplishment made by the collector, Andrew G. Carey, Jr., in his numerous surveys of the NE Pacific deep-water benthos.

DESCRIPTION. *Shape.* White *in situ*, nearly spherical goblet, 15cm diam., on a very long, thin stalk, estimated from video records as 60cm long, attached to hard bottom. During collection most of stalk left in place and terminal 2-3cm of main body lost during manipulation (Fig. 2B). Dried

recovered specimen has basic form of a calyx (body) with convoluted surface on a long, thin, hollow stalk (Fig. 6A-B). Squat, slightly laterally flattened calyx is 14.7x10.5cm diam., 9.4cm tall. Large superior upper opening, 4.2cm diam., is the upper margin of a cylindrical atrial cavity, the osculum proper and its marginal structures lost during collection. Atrial cavity extends axially 5cm down into body dividing into 4 large, radial, exhalant canals, 1.7cm diam., separated by broad tissue septa, and into stalk lumen aperture located on a central conical prominence on floor of atrium (Fig. 6B). Smaller exhalant canals, 0.4-1.0cm diam. extend radially from lateral atrial walls and four main exhalant canals deep into diverticula of lateral and inferior body wall. Diverticula are manifest on external body surface as softly rounded protrusions, 0.8-2.5cm diam., often joined as ridges which circumscribe deep embayments of outer surface; protrusions and ridges exhibit no regular arrangement. On lower third of body, protrusions lengthen to 4.2cm, and terminate in parietal oscula 0.5-0.8cm diam. Proper body wall only 3.3-4.1mm thick at any point, but due to protrusions and their anastomosis, the convoluted and cavernous wall is effectively 3.5-4.3cm thick. A thin, delicate hydrozoan colony permeates entire wall of body, with unprotected terminal polyps located on all sponge body surfaces: external, atrial and larger exhalant canals.

Two recovered stalk pieces total 23.3cm long, ca. 40% of entire stalk in place; tapers from base of body, 1.5cm diam., to lower broken end, 1.1cm diam. Stalk wall thickness is uniform, 1.0mm. All recovered stalk living (sponge tissues present throughout).

*Colour*: White alive (video tape) and dried.

*Skeleton.* Dermal surface of body smooth and covered by a tight quadratic lattice of pinnular hexactins of 200µm mesh. Immediately below are openings of inhalant canals, mean diameter 0.6mm (range 0.5-0.9mm). Spirodiscohexasters abundant in, and just below, dermal layer. Gastral surface not covered by a spicule lattice, but consists of open ends of small calibre exhalant canals, mean diam. 1.2mm (range 0.6-2.0mm). Ridges between adjacent canal apertures carry 2-4 ranks of overlapping pinnular hexactins, pinnular rays spaced 150µm apart; ridges densely tufted. Ridges supported by conspicuous bundles of diactins coursing sinuously between exhalant canals in plane parallel to, but just below, aperture margins. Parenchyme supported by loose network of macrohexactins and diactins, the latter as single spicules or in small bundles of 2-6 spicules. No discernable layering or orientation of parenchymal megascleres.

Stalk skeleton mainly composed of tightly synapticula-joined diactins, oriented randomly with respect to stalk axis; diacts oriented longitudinally only in outermost layer. A few loose pinnules remain on outer surface, but most lost by abrasion during collection and subsequent handling. Some hexactine pinnules fused into outer layer by synapticulae. Internal surface without free gastralia; their absence not attributable to abrasion.

*Megascleres.* All megascleres sparsely and inconspicuously spined throughout, not apparent below 100x magnifications. Principalia are parenchymal diactins and hexactins. Diactins (Fig 7A) smooth (at low magnification), thin, with 4 conspicuous central tubercles; tips rounded or parabolic, not densely microspined; length 2.78±0.66mm (range 1.18-5.06mm; n=100), width 11.5±2.1µm (range 7.1-18.2µm; n=100). Parenchymal hexactins (Fig. 7C) have thin, often curved rays, ray length 738±239µm (range 258-1,341µm; n=100), ray width 11.8±2.0µm (range 5.3-16.7µm; n=100). Dermalia and gastralia are pinnulate hexactins; most have long, sharp-tipped, spindle-form pinnulus (Figs 6D, 7B, left) but 10% of dermalia have shorter, blunt-tipped, club-shaped pinnulus (Fig. 7B right); dermal and gastral spicules significantly different in dimensions (t-test; $P<0.05$). Dermalia pinnulus length 496±32µm (range 392-595µm; n=100), tangential ray length 203±33µm (range 116-297µm; n=100), proximal ray length 373±106µm (range 106-604µm; n=100). Gastralia pinnulus length 478±67µm (range 338-730µm; n=100), tangential ray length 319±75µm (range 193-655µm; n=100), proximal ray length 502±158µm (range 122-841µm; n=100).

*Microscleres.* Spirodiscohexasters (Figs 6E, 7E) usually spherical in aspect but secondary bundles often restricted in angular splay and central-most secondaries are longer than peripherals, producing noticeable cruciate profile. Secondaries number 15-24 and spiral is sinistral (counterclockwise) (Fig 6F). Terminal discs hemispherical with 15-20 marginal teeth, occurring most commonly in and near dermal and gastral surfaces, but found throughout wall and in stalk; diameter: 147±13µm (range 118-176µm; n=100). Drepanocomes (Figs 6C, 7D) are large oxyhexasters with recurved secondary rays (hooks); secondaries 4-8, occasionally branched

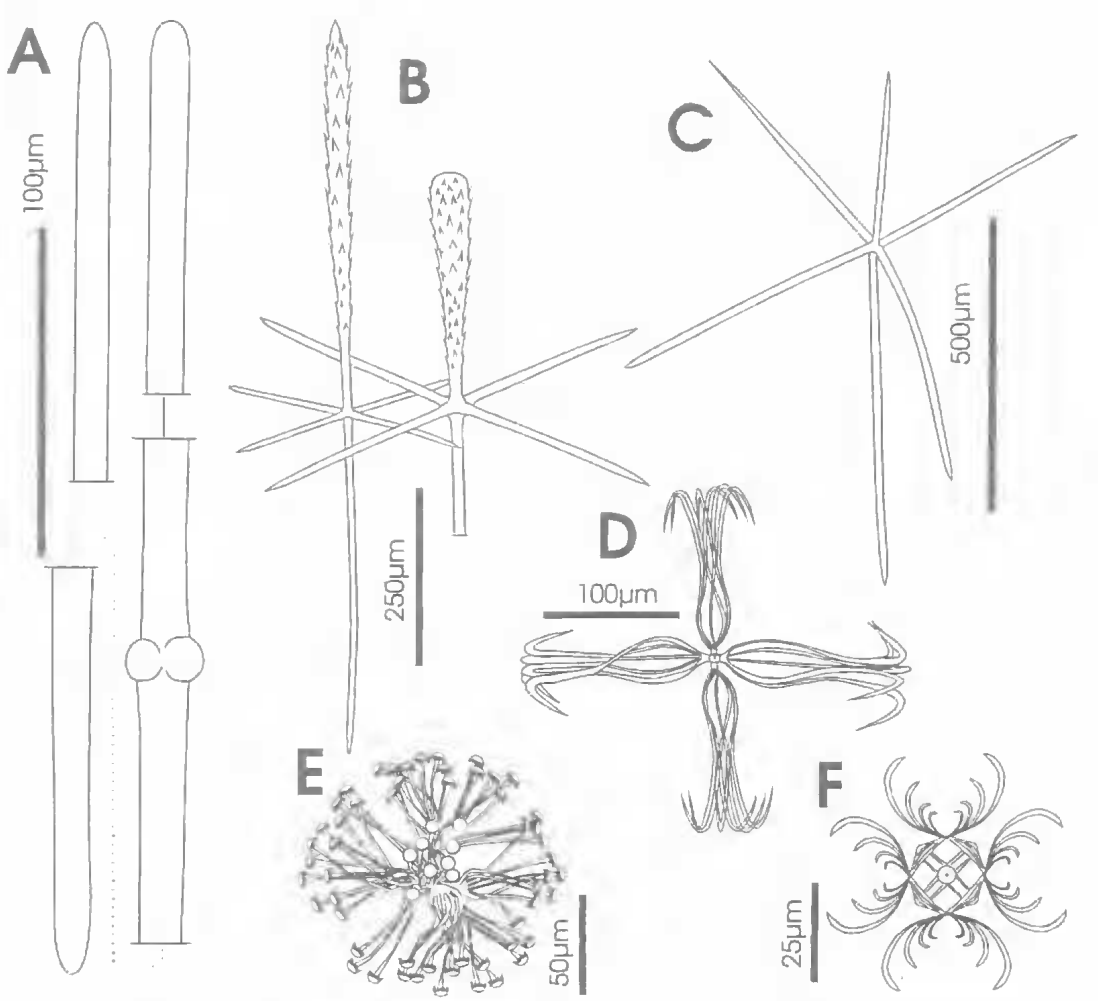


FIG. 7. *Nubicaulus caryi* sp. nov., spicules of the Holotype. A, Diactins. B, Dermal and gastral pinnular hexactins. C, Macrohexactin. D, Drepanocome, two rays perpendicular to the page omitted. E, Spirodiscohexaster. F, Aspidoplumicome, two rays perpendicular to the page omitted.

at terminal bend; uncommon, occuring in stalk and throughout body wall, but not closely associated with surface layers. Body drepanocomes slightly smaller than those of stalk (t-test: $P<0.01$). Body drepanocome: diameter 265±40µm (range 142-329µm; n=68); stalk drepanocome: diameter 297±19µm (range 234-326µm; n=38). Aspidoplumicomes (Figs 6G, 7C) delicate hexasters with shield-like primary terminations nearly contacting adjacent shields. About 60 secondaries emanate from each primary shield in a single marginal whorl but differ in length and angle of curvature, thereby forming a series of 4-5 apparent 'layers' when seen in profile (Fig. 7F); distributed throughout body wall and stalk. Diameter 65±6µm (range 50-76µm; n=72), primary ray length (to distal surface of shield) 11.2±0.9µm (range 8.9-14.2µm; n=87).

REMARKS. Drepanocomes have been reported from three monospecific genera of Corbitellinae, *Dictyaulus* Schulze, *Hertwigia* Schmidt, and *Trachycaulus* Schulze, and from a single Euplectellinae, *Holascus belyaevi* Koltun, 1970. The new species differs from *Dictyaulus* in at least 10 significant characters, including (in *Dictyaulus*): gastral pentactins, floricomes, codonhexasters, non-spiral discohexasters. The

genus *Hertwigia* differs in at least four characters including its possession of gastral pentactins, floricomes, oxyhexasters, and codonhexasters, all of which are absent in *Nubicaulus careyi*. Koltun's *H. belyaevi* differs from *N. careyi* in at least seven characters, including its tubular (*Euplectella*-like) body form, possession of tetractins as principalia, oxyhexasters, oxyhexactins, and graphiocomes as well as absence of spirodiscohexasters and aspidoplumicomes. Thus the new species, *N. careyi*, shows little affinity with any of these taxa. The poorly known genus and species, *Trachycaulus gurlitti*, consists entirely of only two short sections of hollow stem totalling 9cm length, collected by the 'Challenger' in the mid-southern Pacific Ocean (Schulze, 1887). Schulze reported its spiculation as including pinnular hexactins, parenchymal hexactins, and drepanocomes, all compatible with the new species. He also reported simple oxyhexasters which were never figured and are here considered to have been a mistaken earlier statement from Schulze's original description (Schulze, 1886). The holotype of *T. gurlitti* (BMNH 1187.10.20.42) was re-examined using filtration methods to recover small pieces of spicules lodged in the stalk framework. It was found to contain, in addition to the spicules reported by Schulze, two classes of codonhexasters. There was no indication of the presence of any other microsclere such as plumicomes, graphiocomes, floricomes, etc. If any of these were present in the remaining stem tissues, their secondary rays or parts of them, would certainly have been detected by this method. The presence of codonhexasters and absence of spirodiscohexasters and aspidoplumicomes in *Trachycaulus gurlitti* are considered sufficient differences to prevent inclusion of the new species in that genus. This new information on *Trachycaulus*, which is added to its revised diagnosis (below), pertains to a suggestion by Lévi (1964) that *T. gurlitti* be synonymised with *Hertwigia falcifera*. The combination of dermal pinnular hexactins, drepanocomes and codonhexasters is shared by both of these species, but the same are also shared by *Dictyaulus elegans*. The absence of any evidence of floricomes in *T. gurlitti*, as well as its geographic location, argue against Lévi's suggestion. For the present, it is recommended that both the genus and species represented by *T. gurlitti* be maintained as distinct, but still poorly known, entities.

**Trachycaulus** Schulze, 1886

TYPE SPECIES. *Trachycaulus gurlittii* Schulze, 1886:46.

DIAGNOSIS (based on re-inspection of holotype BMNH 1887.10.20.42, and modification of the description summary by Schulze, 1887:373). Corbitellinae with principalia as long diactins and thin oxyhexactins. Known only as a hollow stalk; upper body remains unknown. Diactins arranged in parallel longitudinal series in stalk and united by profuse synapticula. Dermalia are thin pinnular hexactins; gastralia unknown. Microscleres include large drepanocomes with 4 secondary rays per primary, and two classes of small codonhexasters.

DISTRIBUTION. Mid south Pacific, 4665m depth.

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**THE SPONGES OF PARAISO NEARSHORE FRINGE REEF, COZUMEL, MEXICO.** *Memoirs of the Queensland Museum 44: 508. 1999*:- Although sponges as a group are an easily recognisable life form, in ecological studies the identification of individual species of this phylum can be problematic. The objective of this study was to identify and describe the sponge species of the Paraíso nearshore fringing reef off the island of Cozumel, Mexico. A survey of sponges living within an 80m x 40m permanent study site was conducted using underwater video. Sponge tissue samples were also collected. A field guide based on morphological characteristics was compiled describing 42 different sponges, representing 9 orders, 18 families and 21 genera of the class Demospongiae. Comparing the results of this study with earlier descriptions of the diversity of this sponge community indicate the importance of correct sponge identifications for accurate evaluation of changes in reef community structure. The results of this study suggest that regional identification guides are necessary for life forms such as sponges that have a plastic morphology that can be dramatically affected by environmentally induced variables. □ *Porifera, taxonomy, species list, reefs, biodiversity, Cozumel, Mexico, field guide.*

*J. Ritter (email: jritter@bbsr.edu), Bermuda Biological Station for Research, Ferry Reach GE01, Bermuda. 1 June 1998.*